

Announcement No. JSC-CCDev-1 - August 18, 2009

Prepared for:  
**National Aeronautics and Space Administration (NASA)**  
Commercial Crew & Cargo Program Office  
Exploration Systems Mission Directorate  
Johnson Space Center, Mail Code QA  
Houston, TX 77058-3696

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National Aeronautics and Space Administration



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12/04/2009

28-08860

# **Commercial Crew Development**

**Appendix 1 Space Act Agreement**

**Announcement No. JSC-CCDev-1**

Commercial Crew and Cargo Program Office  
Lyndon B. Johnson Space Center  
Exploration Systems Mission Directorate

**For Questions Regarding This Announcement Visit:**

**<http://procurement.jsc.nasa.gov/CCDev/>**

## Appendix 1

SPACE ACT AGREEMENT NO. XXXXX  
BETWEEN  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND  
SIERRA NEVADA CORPORATION ("SNC")  
FOR  
COMMERCIAL CREW DEVELOPMENT (CCDev)

### BACKGROUND

NASA has established the Commercial Crew and Cargo Program Office at the Johnson Space Center as part of the Exploration Systems Mission Directorate. The objectives of the Commercial Crew and Cargo Program are to:

- Implement U.S. Space Exploration policy with investments to stimulate the commercial space industry;
- Facilitate U.S. private industry demonstration of cargo and crew space transportation capabilities with the goal of achieving safe, reliable, cost effective access to low-Earth orbit; and
- Create a market environment in which commercial space transportation services are available to Government and private sector customers.

NASA has been allocated funds from the American Recovery and Reinvestment Act of 2009 (ARRA) to support exploration activities. The purposes of the ARRA are to:

- Preserve and create jobs and promote economic recovery;
- Assist those most impacted by the recession;
- Provide investments needed to increase economic efficiency by spurring technological advances in science and health;
- Invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits; and
- Stabilize State and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive state and local tax increases.

This Space Act Agreement (the "Agreement") represents Sierra Nevada Corporation's and NASA's commitment to meet the purposes of ARRA by making significant progress on commercial crew spaceflight long lead capabilities, technologies, and commercial crew risk mitigation tasks as well as accelerate and mature the design and development of SNC's

commercial crew space transportation system.

#### ARTICLE 1. AUTHORITY

This Agreement is entered into by the National Aeronautics and Space Administration, located at 300 E Street, SW, Washington, D.C. (hereinafter referred to as "NASA" or Government), and Sierra Nevada Corporation., (hereinafter referred to as "SNC" or "Participant") with a place of business at 1722 Boxelder Street, Louisville Colorado 80027. NASA's authority to enter into this Agreement is in accordance with the authority set forth in Sections 203(c)(5) and 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended. This agreement will be implemented by NASA at the Lyndon B. Johnson Space Center in Houston, Texas.

#### ARTICLE 2. PURPOSE

The purpose of this Agreement is to partially fund the development of system concepts, key technologies, and capabilities that could ultimately be used in commercial crew human space transportation systems. This development work must show, within the timeframe of the Agreement, significant progress on commercial crew spaceflight long lead capabilities, technologies, and commercial crew risk mitigation tasks as well as mature the design and development of SNC's commercial crew space transportation concept. SNC will receive payments from NASA upon successful completion of agreed upon milestones as described in Appendix 2 of this Agreement.

#### ARTICLE 3. RESPONSIBILITIES

##### A. SNC shall:

- (1) Conduct the CCDev effort according to the milestones identified in Appendix 2 to this Agreement.
- (2) Provide required financial reporting and technical progress reports as required under Article 5 of this Agreement and to support the milestones identified in Appendix 2 to this Agreement.
- (3) Meet all applicable ARRA requirements as identified in this Agreement and related ARRA guidance.

##### B. NASA shall:

- (1) Provide milestone payments to SNC upon successful completion of each milestone, subject to limitations noted below.
- (2) Provide appropriate oversight of ARRA funds expended under this Agreement.

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12/09/2009

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#### ARTICLE 4. SCHEDULE AND MILESTONES

The scheduled major milestones and acceptance criteria for each milestone for the CCDev effort are identified in Appendix 2 to this Agreement

#### ARTICLE 5. FINANCIAL OBLIGATIONS

A. NASA's Obligation. The Government's liability to make payments to SNC is limited to only those funds obligated under this Agreement or by amendment to the Agreement. NASA may obligate funds to the Agreement incrementally.

B. Acceptance and Payment for Milestones.

(1) SNC shall notify the NASA Principal Points of Contact at least 30 calendar days prior to the completion of any milestone to arrange for the NASA Technical Contact or designee to witness the event or accept delivery of documents. NASA shall have 30 calendar days to determine whether the milestone event meets its corresponding acceptance criteria as described in Appendix 2 of this Agreement and shall notify SNC of NASA's acceptance or non-acceptance. Disagreement about the successful accomplishment of a milestone shall be deemed a Dispute and resolved in accordance with Article 19 of this Agreement. NASA and SNC agree that time is of the essence for the payment of milestones hereunder and each will make best efforts to ensure that milestones are accepted (if appropriate) and invoiced prior to September 30, 2010, the end of NASA's 2010 fiscal year.

(2) SNC shall be able to submit an invoice requesting payment upon the accomplishment and acceptance by NASA of the milestone as identified and described in Appendix 2 of this Agreement. SNC shall submit an invoice via e-mail to the NASA Shared Services Center at NSSC-AccountsPayable@nasa.gov. There shall be no more than one (1) invoice per e-mail submission. After receipt and review of the invoice, the NASA Shared Services Center will coordinate with the NASA Administrative Contact to authorize payment. Subject to change only through written Agreement modification, payment shall be made via electronic funds transfer to the address set forth below:

Bank Account of Payee:

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

(3) The following information shall be included on each invoice:  
Agreement Number

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Invoice Number  
A description of milestone event  
Terms of Payment  
Payment Office  
Agreed Milestone Amount

(4) Financial Records and Reports:

(a) Registration with [FederalReporting.gov](http://FederalReporting.gov). Within 10 business days of the execution of this Agreement, SNC must register with [www.FederalReporting.gov](http://www.FederalReporting.gov) to ensure reporting requirements under this Agreement will be met in a timely fashion.

(b) Quarterly Financial Reporting. Pursuant to Section 1512 of the American Recovery and Reinvestment Act (ARRA), not later than 10 business days after the end of each calendar quarter, the participant shall submit a financial report to NASA through [www.FederalReporting.gov](http://www.FederalReporting.gov).

The quarterly financial report shall include:

(1) For SNC:

- (i) Identification of the program or project title as "CCDev"
- (ii) the Space Act Agreement Number for this Agreement;
- (iii) the amount of ARRA funds invoiced during the reporting period;
- (iv) a summary of the monthly technical reports provided under Article 5, section 6, below, since the previous quarterly report;
- (v) an assessment of progress toward completion of the milestones set forth in Appendix 2 of this Agreement;
- (vi) a narrative description of the employment impact of SNC's use of ARRA funding, including number and type of jobs created or jobs retained by SNC; and

(2) For SNC first tier contractors/partners receiving over \$25,000 in ARRA funding from SNC:

- (i) contractor/partner name, DUNS number, physical address and primary location of performance of activities using ARRA funding;
- (ii) total amount of ARRA funding anticipated to be provided, date of relevant contract or agreement; NAICS code and identifying NASA as the funding agency;
- (iii) a description of the products or services being provided by the contractor/partner, including the overall purpose and expected outcome from expenditure of ARRA funding; and

(3) For (a) SNC first tier contractors/partners receiving less than \$25,000 in ARRA funding from SNC, (b) first tier contractors/partners receiving ARRA funding from SNC but who had less than \$300,000 in gross income in tax year 2008, and (c) individuals receiving ARRA funding from SNC: SNC shall report only the aggregate number of such contractors/partners and individuals and the aggregate total amount of ARRA funding provided by SNC.

(5) Segregation of ARRA Funding. In accordance with ARRA requirements, ARRA funding received by SNC under this Agreement shall be tracked and reported separately and shall not be comingled with other funding. These reports will be made publicly available by NASA through posting on a website not later than 30 calendar days after the end of each calendar quarter.

(6) Monthly Technical Progress Reports:

SNC shall also provide monthly technical progress reports no later than the 20<sup>th</sup> day of each month, covering the previous month. The monthly technical report shall be provided to the NASA Administrative Contact. Progress made shall be estimated and reported in a mutually agreed to quantifiable performance method using milestone reporting, percent complete or some other methodology other than percent hours exhausted or percent cost incurred. The monthly technical progress reports must describe the progress made since the last report, plans forward and shall also describe any difficulties encountered and the corrective action necessary to recover. The final technical progress report provided shall describe not only work complete but also shall document how this activity has reduced the overall risk to SNC's commercial crew space transportation concept and shall also document the way in which lessons learned as the result of these activities being incorporated into the design and manufacturing efforts of SNC commercial crew space transportation concept.

(7) Access to Records: The Comptroller General of the United States, and appropriate Inspector General appointed under section 3 or 8G of the Inspector General Act of 1978, or an authorized representative of either of the foregoing officials shall have access to and the right to examine SNC's records or the records of any contractor/partner of SNC that directly pertain to and involve transactions relating to the funding provided by NASA under this Agreement for a period of three (3) years after the Government makes the final payment under this Agreement. Further, the Comptroller General shall have access to interview any officer or employee of SNC or its contractors/partners regarding such transactions for a period of three (3) years after the Government makes the final payment under this Agreement.

#### ARTICLE 6. DISSEMINATION OF PUBLIC INFORMATION

A. NASA or SNC may, consistent with Federal law and this Agreement, release general information regarding its participation in this Agreement as desired. SNC agrees that all press

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releases resulting from activities conducted under this Agreement will be reviewed and concurred on by the NASA JSC Director of Public Affairs prior to release. Such approval will not be unreasonably withheld.

B. SNC agrees the words "National Aeronautics and Space Administration" or the letters "NASA" will not be used in connection with a product or service in a manner reasonably calculated to convey any impression that such product or service has the authorization, support, sponsorship, or endorsement of NASA, which does not, in fact, exist. In addition, SNC agrees that any proposed use of the NASA name or initials shall be submitted by SNC in advance to the NASA Administrative Contact, who will submit the proposed use to the JSC Director of Public Affairs for review and approval. Such approval shall not be unreasonably withheld. Use of NASA emblems/devices (i.e., NASA Seal, NASA Insignia, NASA logotype, NASA Program Identifiers, and the NASA Flag) is governed by 14 C.F.R. Part 1221. SNC agrees that any proposed use of such emblems/devices shall be submitted in advance to the NASA Administrative Contact, who will submit the proposed use the NASA JSC Director of Public Affairs for review and approval in accordance with such regulations.

C. NASA does not endorse or sponsor any commercial product, service, or activity. NASA's participation in this Agreement does not constitute endorsement by NASA. SNC agrees that nothing in this Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of SNC resulting from activities conducted under this Agreement.

#### ARTICLE 7. NASA FURNISHED INFORMATION AND SERVICES

A. NASA may, at its sole discretion and on terms to be negotiated between the parties, provide SNC services, technical expertise, or access to Government Property. Such NASA services, technical expertise, or access to Government Property may be provided on either a reimbursable or non-reimbursable basis. Specific services and property and any terms and conditions applicable to the provision of such services, technical expertise and access to Government property will be identified in appropriate appendices to this Agreement. Unless NASA specifically requires SNC to use NASA furnished services, technical expertise, or Government Property to fulfill its obligations under this Agreement, any decision by SNC to use NASA furnished services, technical expertise, or Government Property shall be at SNC's option and sole discretion. SNC shall remain solely responsible for completion of its milestones under this Agreement regardless of the availability or use of such optional NASA services, technical expertise, or Government Property.

B. SNC has the ability to enter into separate Space Act agreements with NASA Centers to use NASA resources in performance of this Agreement. The terms and conditions of such other Space Act agreements will govern the use of NASA resources not being provided under this Agreement.



#### ARTICLE 8. NONEXCLUSIVITY

This Agreement is not exclusive; accordingly, NASA may enter into similar Agreements for the same or similar purpose with other entities.

#### ARTICLE 9: PARTICIPANT CERTIFICATIONS

Within 10 calendar days of the effective date of this agreement or within 10 calendar days of any change in status under A. through D. below (including the addition of any new contractor/partner), SNC shall certify the following to the NASA Administrative Contact:

- A. SNC or any of its contractors/partners are not presently debarred, suspended, proposed for debarment, or otherwise declared ineligible for award of funding by any Federal agency.
- B. SNC or any of its contractors/partners have not been convicted nor had a civil judgment rendered against it within the last three (3) years for fraud in obtaining, attempting to obtain, or performing a Government contract.
- C. SNC or any of its contractors/partners receiving \$100,000 or more in NASA funding for work performed under this Agreement must certify that they have not used any such funds for lobbying purposes prohibited by 31 U.S.C. 1352.
- D. SNC is an eligible participant as defined in Section 4.2 of the CCDev Announcement.

#### ARTICLE 10. PROTECTION OF WHISTLEBLOWERS

A. Pursuant to ARRA, an employee of any non-Federal employer receiving recovery funds may not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing to the Recovery Accountability and Transparency Board, an Inspector general, the Comptroller General, a member of Congress, a State or Federal regulatory or law enforcement agency, a person with supervisory authority over the employee (or such other person working for the employer who has the authority to investigate, discover, or terminate misconduct), a court or grand jury, the head of a Federal agency, or their representatives, information that the employee reasonably believes is evidence of—

- (1) gross mismanagement of an agency contract or grant relating to recovery funds;
- (2) a gross waste of recovery funds;
- (3) a substantial and specific danger to public health or safety related to the implementation or use of recovery funds;
- (4) an abuse of authority related to the implementation or use of recovery funds; or

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(5) a violation of law, rule, or regulation related to an agency contract (including the competition for or negotiation of a contract) or grant, awarded or issued relating to recovery funds.

B. A person who believes that anyone has been subjected to a reprisal prohibited in Section 10.A. above may submit a complaint regarding the reprisal to the NASA Inspector General's office.

C. SNC shall post notice of the rights and remedies provided for under §1553 of ARRA.

D. Any contractor/partner of SNC that receives ARRA funds from this Agreement shall promptly refer to the NASA Inspector General any credible evidence that a principal, agent, contractor, subcontractor, or other person has committed a criminal or civil violation of laws pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct involving ARRA funding received by SNC under this Agreement.

#### ARTICLE 11. LIABILITY AND RISK OF LOSS

A. SNC hereby waives any claims against NASA, its employees, its related entities, (including, but not limited to, contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors and subcontractors, at any tier) and employees of NASA's related entities for any injury to, or death of, SNC employees or the employees of SNC's related entities, or for damage to, or loss of, SNC's property or the property of its related entities arising from or related to activities conducted under this Agreement, whether such injury, death, damage, or loss arises through negligence or otherwise, except in the case of willful misconduct.

B. SNC further agrees to extend this unilateral waiver to its related entities by requiring them, by contract or otherwise, to waive all claims against NASA, its related entities, and employees of NASA and employees of NASA's related entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement.

#### ARTICLE 12. LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS

SNC or its contractors/partners shall not use any funds provided under this Agreement to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

## ARTICLE 13. INTELLECTUAL PROPERTY AND DATA RIGHTS - RIGHTS IN DATA

### A. General

(1) "Related Entity" as used in this Article, means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or SNC that is assigned, tasked, or contracted with to perform specified NASA or SNC activities under this Agreement.

(2) "Data," as used in this Agreement, means recorded information, regardless of form, the media on which it may be recorded, or the method of recording. The term includes, but is not limited to, data of a scientific or technical nature, software and documentation thereof, and data comprising commercial and financial information.

(3) "Proprietary Data," as used in this Article, means Data embodying trade secrets or comprising commercial or financial information that is privileged or confidential.

(4) The Data rights set forth herein are applicable to employees of SNC and employees of any Related Entity of SNC. SNC shall ensure that its employees and employees of any Related Entity that perform SNC activities under this Agreement are aware of the obligations under this Article and that all such employees are bound to such obligations.

(5) Data exchanged between NASA and SNC under this Agreement will be exchanged without restriction as to its disclosure, use, or duplication except as otherwise provided in this Article.

(6) No preexisting Proprietary Data will be exchanged between the Parties under this Agreement unless specifically authorized in this Article or in writing by the owner of the Proprietary Data.

(7) In the event that Data exchanged between NASA and SNC include a restrictive notice that NASA or SNC deems to be ambiguous or unauthorized, NASA or SNC may inform the other Party of such condition. Notwithstanding such a notice, as long as such notice provides an indication that a restriction on use or disclosure was intended, the Party receiving such Data will treat the Data pursuant to the requirements of this clause unless otherwise directed in writing by the party providing such Data.

(8) Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this clause, the Parties will not be restricted in the use, disclosure, or reproduction of Data provided under this Agreement that: (a) is publicly available at the time of disclosure or thereafter becomes publicly available without breach of this Agreement; (b) is known to, in the possession of, or developed by the receiving Party independent of carrying out the receiving Party's responsibilities under this Agreement and independent of any disclosure of, or without reference to, Proprietary Data or otherwise protectable Data hereunder; (c) is received from a third party having the right to disclose such information without restriction; or (d) is required to be produced or released by the receiving Party pursuant to a court order or other legal requirement.

(9) If either NASA or SNC believes that any of the events or conditions that remove restriction on the use, disclosure, or reproduction of the Data apply, NASA or SNC will promptly notify the other Party of such belief prior to acting on such belief, and, in any event, will notify the other Party prior to an unrestricted use, disclosure, or reproduction of such Data.

(10) **Disclaimer of Liability:** Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this Article, NASA will not be restricted in, nor incur any liability for, the use, disclosure, or reproduction of any Data not identified with a suitable restrictive notice in accordance with paragraphs B and G of this Article or of any Data included in Data which SNC has furnished, or is required to furnish to the U.S. Government without restriction on disclosure and use.

(11) SNC may use the following, or a similar, restrictive notice as required by paragraphs B and G of this Article. In addition to identifying Proprietary Data with such a restrictive notice, SNC should mark each page containing Proprietary Data with the following, or a similar, legend: "PROPRIETARY DATA -- use and disclose only in accordance with notice on title or cover page."

#### Proprietary Data Notice

These data herein include *<enter as applicable: "Background Data" or "Data Produced by SNC under a Space Act Agreement">* in accordance with the Data Rights provisions under Space Act Agreement *<provide applicable identifying information>* and embody Proprietary Data. In accordance with the Space Act Agreement, NASA will use reasonable efforts to maintain the data in confidence and limit use, disclosure, and reproduction by NASA and any Related Entity of NASA (under suitable protective conditions) in accordance with restrictions identified in the Space Act Agreement *<may list specific restrictions listed in the Agreement>*.

#### B. Data First Produced by SNC under this Agreement

(1) Data first produced by SNC in carrying out SNC's responsibilities under this Agreement, including but not limited to technical data related to inventions made under this Agreement, will be furnished to NASA upon request and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) during the term of this Agreement only for evaluating SNC's performance under this Agreement. If SNC considers any such Data to be Proprietary Data, and such Data is identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence.

(2) Upon a successful completion by SNC of all milestones under this Agreement, NASA shall not assert rights in such Data or use such Data for any purpose except that NASA shall retain the right to: (1) maintain a copy of such Data for archival purposes; and (2) use or disclose such archived Data by or on behalf of NASA for Government purposes in the event the NASA determines that

(a) Such action is necessary because SNC, its assignee, or other successor has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of inventions, hardware, or software related to such Data;

(b) Such action is necessary because SNC, its assignee, or other successor, having achieved practical application of inventions, hardware, or software related to such Data, has failed to maintain practical application;

(c) Such action is necessary because SNC, its assignee, or other successor has discontinued making the benefits of inventions, hardware, or software related to such Data available to the public or to the Federal Government;

(d) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by SNC, its assignee, or other successor; or

(e) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by SNC, its assignee, or successor.

In the event NASA determines that one of the circumstances listed in subparagraphs (a)–(e) above exists, NASA shall provide written notification to the SNC Administrative Point of Contact. Upon mailing of such determination, SNC shall have thirty (30) days to respond by providing its objection to the determination as a dispute under the Article entitled "Dispute Resolution" of this Agreement. In the event that SNC does not respond in writing to NASA's determination, then such determination shall serve as a final agency decision for all purposes including judicial review.

(3) In the event NASA terminates this Agreement in accordance with Article 17.B., Termination for Failure to Perform, NASA shall have the right to use, reproduce, prepare derivative works, distribute to the public, perform publicly, display publicly, or disclose Data first produced by SNC in carrying out SNC's responsibilities under this Agreement by or on behalf of NASA for Government purposes.

(4) The parties will negotiate rights in Data in the event of termination for any other reason.

#### C. Data First Produced by NASA under this Agreement

(1) As to Data first produced by NASA (or any Related Entity of NASA) in carrying out NASA responsibilities under this Agreement that would be Proprietary Data if it had been obtained from SNC, such Data will be appropriately marked with a restrictive notice and maintained in confidence for the duration of this Agreement, with the express understanding that during the aforesaid restricted period such marked Data may be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for carrying out NASA responsibilities under this Agreement.

(2) Upon a successful completion by SNC of all milestones under this Agreement, NASA shall not use such Data for any purpose except that NASA shall retain the right to: (1) maintain and reproduce copies of such Data for archival purposes; and (2) use or disclose such archived Data by or behalf of the NASA for Government purposes in the event the NASA determines that

(a) Such action is necessary because SNC, its assignee, or other successor has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of inventions, hardware, or software related to such Data;

(b) Such action is necessary because SNC, its assignee, or other successor, having achieved practical application of inventions, hardware, or software related to such Data, has failed to maintain practical application;

(c) Such action is necessary because SNC, its assignee, or other successor has discontinued making the benefits of inventions, hardware, or software related to such Data available to the public or to the Federal Government;

(d) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by SNC, its assignee, or other successor; or

(e) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by SNC, its assignee, or successor.

In the event NASA determines that one of the circumstances listed in subparagraphs (a)-(e) above exists, NASA shall provide written notification to the SNC Administrative Point of Contact. Upon mailing of such determination, SNC shall have thirty (30) days to respond by providing its objection to the determination as a dispute under the Article entitled "Dispute Resolution" of this Agreement. In the event that SNC does not respond in writing to NASA's determination, then such determination shall serve as a final agency decision for all purposes including judicial review.

(3) In the event NASA terminates this Agreement in accordance with Article 17.B., Termination for Failure to Perform, NASA shall have the right to use, reproduce, prepare derivative works, distribute to the public, perform publicly, display publicly, or disclose Data first produced by NASA in carrying out NASA's responsibilities under this Agreement by or on behalf of NASA for Government purposes.

(4) The parties will negotiate rights in Data in the event of termination for any other reason.

#### D. Publication of Results

(1) Recognizing that section 203 of the National Aeronautics and Space Act of 1958 (42 U.S.C. § 2473), as amended, requires NASA to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof, and that the dissemination of the results of NASA activities is one of the considerations for this Agreement, NASA will coordinate proposed publication of results with SNC in a manner that allows SNC a reasonable amount of time to review and comment on proposed publications.

(2) Consistent with other obligations in this Article, NASA agrees that it will not publish any results without first receiving permission from SNC.

#### E. Data Disclosing an Invention

In the event Data exchanged between NASA and SNC discloses an invention for which patent protection is being considered, the furnishing party specifically identifies such Data, and the disclosure and use of such Data is not otherwise limited or restricted herein, the receiving party agrees to withhold such Data from public disclosure for a reasonable time (presumed to be 1 year unless mutually agreed otherwise) in order for patent protection to be obtained.

F. Data Subject to Export Control

Technical data, whether or not specifically identified or marked, that is subject to the export laws and regulations of the United States and that is provided to SNC under this Agreement will be treated as such, and will not be further provided to any foreign persons or transmitted outside the United States without proper U.S. Government authorization, where required.

G. Background Data

(1) In the event SNC furnishes NASA with Data developed at private expense that existed prior to, or was produced outside of, this Agreement, and such Data embody Proprietary Data, and such Data is so identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for evaluating SNC's performance under this Agreement. Upon completion of activities under this Agreement, such Data will be disposed of as requested by SNC.

(2) At the time of execution of this Agreement, the Parties agree that the following Background Data embodies Proprietary Data that will be provided to NASA: NONE

H. Handling of Data

(1) In the performance of this Agreement, SNC and any Related Entity of SNC may have access to, be furnished with, or use the following categories of Data:

(a) Proprietary Data of third parties that the U.S. Government has agreed to handle under protective arrangements; and/or

(b) U.S. Government Data, the use and dissemination of which, the U.S. Government intends to control.

(2) Data provided by the U.S. Government under the Agreement

(a) The Parties agree that, during the term of this Agreement, SNC may request from NASA, and NASA may provide, Proprietary Data of third parties, with the express understanding that SNC will use and protect such Data in accordance with this Article.

(b) The Parties agree that, during the term of this Agreement, SNC may request from NASA, and NASA may provide, U.S. Government Data, with the express understanding that SNC will use and protect such U.S. Government Data in accordance with this Article.

(c) At the time of execution of this Agreement, the Parties agree that the following software and related Data will be provided to SNC under a separate Software Usage Agreement with the express understanding that SNC will use and protect such related Data in accordance with this Article: NONE. Unless SNC has entered into a license, consistent with 37 C.F.R. Part 404, for software provided under this Agreement, upon completion of activities under this Agreement, such related Data will be disposed of as instructed by NASA. Note: From time to time during the term of this Agreement, SNC may request from NASA, and NASA may provide, such software and related data.



(3) With respect to such Data specifically identified in this Agreement or specifically marked with a restrictive notice, SNC agrees to:

- (a) Use, disclose, or reproduce such Data only to the extent necessary to perform the work required under this Agreement;
- (b) Safeguard such Data from unauthorized use and disclosure;
- (c) Allow access to such Data only to its employees and any Related Entity that require access for their performance under this Agreement;
- (d) Except as otherwise indicated in (3)(c) above, preclude access and disclosure of such Data outside SNC's organization;
- (e) Notify its employees who may require access to such Data about the obligations under this Article, and ensure any Related Entity performs the same functions with respect to its employees; and
- (f) Return or dispose of such Data, as NASA may direct, when the Data is no longer needed for performance under this Agreement.

#### I. Oral and visual information

If information that SNC considers to be Proprietary Data is disclosed orally or visually to NASA, NASA will have no duty to limit or restrict, and will not incur any liability for, any disclosure or use of such information unless (1) SNC orally informs NASA before initial disclosure that such information is considered to be Proprietary Data, and (2) SNC reduces such information to tangible, recorded form that is identified and marked with a suitable restrictive notice as required by paragraphs B and G above and furnishes the resulting Data to NASA within 10 calendar days after such oral or visual disclosure.

### ARTICLE 14. INTELLECTUAL PROPERTY AND DATA RIGHTS - INVENTION AND PATENT RIGHTS

#### A. Definitions

(1) "Administrator," as used in this Article, means the Administrator of the National Aeronautics and Space Administration (NASA) or duly authorized representative.

(2) "Patent Representative" as used in this Article means the NASA Johnson Space Center Patent Counsel. Correspondence with the Patent Representative under this clause will be sent to the address below:

Patent Counsel  
NASA Johnson Space Center  
Mail Code AL  
2101 NASA Parkway  
Houston, TX 77058

(3) "Invention," as used in this Agreement, means any innovation or discovery that is or may be patentable or otherwise protectable under title 35 of the U.S.C.



(4) "Made," as used in relation to any invention, means the conception or first actual reduction to practice of such invention.

(5) "Practical application," as used in this Agreement, means to manufacture, in the case of a composition or product; to practice, in the case of a process or method; or to operate, in case of a machine or system; and, in each case, under such conditions as to establish that the invention, hardware, software, or related Data is being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public or to the Federal Government on reasonable terms.

(6) "Related Entity" as used in this Article, means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or SNC that is assigned, tasked, or contracted with to perform specified NASA or SNC activities under this Agreement.

## B. Allocation of principal rights

### (1) Presumption of title

(a) Any invention made under this Agreement shall be presumed to have been made in the manner specified in paragraph (1) or (2) of section 305(a) (42 U.S.C. § 2457(a)) of the National Aeronautics and Space Act of 1958 (hereinafter called "the Act"), and the above presumption shall be conclusive unless at the time of reporting such invention SNC submits to the Patent Representative a written statement, containing supporting details, demonstrating that the invention was not made in the manner specified in paragraph (1) or (2) of section 305(a) of the Act.

(b) Regardless of whether title to such an invention would otherwise be subject to an advance waiver or is the subject of a petition for waiver as described in paragraph B.(3) and paragraph I, SNC may nevertheless file the statement described in paragraph B.(1)(a) of this Article. The Administrator (or his designee) will review the information furnished by SNC in any such statement and any other available information relating to the circumstances surrounding the making of the invention and will notify SNC whether the Administrator has determined that the invention was made in the manner specified in paragraph (1) or (2) of section 305(a) of the Act.

(2) Property rights in inventions. Each invention made under this Agreement for which the presumption of paragraph B.(1)(a) of this clause is conclusive or for which there has been a determination that it was made in the manner specified in paragraph (1) or (2) of section 305(a) of the Act shall be the exclusive property of the United States as represented by the Administrator of NASA unless the Administrator waives all or any part of the rights of the United States to SNC's invention, as provided in paragraph B.(3) of this clause.

### (3) Waiver of rights.

(a) The NASA Patent Waiver Regulations, 14 C.F.R. Part 1245, Subpart 1, have adopted the Presidential Memorandum on Government Patent Policy of February 18, 1983, as a guide in acting on petitions (requests) for waiver of rights to any invention or class of inventions made or that may be made in the manner specified in paragraph (1) or (2) of Section 305(a) of the Act.

(b) NASA has determined that to stimulate and support the capability of a United States commercial provider to provide commercial crew space transportation services to the public

and the Federal Government, the interest of the United States would be served by waiving to SNC, in accordance with provisions of 14 C.F.R. Part 1245, Subpart 1, rights to inventions made by SNC in the performance of work under this Agreement. Therefore, upon petition submitted by SNC, as provided in 14 C.F.R. Part 1245, Subpart 1, either prior to execution of the Agreement or within 30 calendar days after execution of the Agreement, for advance waiver of rights to any or all of the inventions that may be made under this Agreement, NASA will waive such rights to SNC. If such a petition is not submitted, SNC may petition for waiver of rights to an identified invention within eight months of first disclosure of invention in accordance with paragraph E.(2) of this clause or within such longer period as may be authorized in accordance with 14 CFR 1245.105. Further procedures are provided in paragraph I of this clause.

C. Minimum rights reserved by the Government

(1) With respect to each SNC invention made under this Agreement for which a waiver of rights is applicable in accordance with 14 C.F.R. Part 1245, Subpart 1, the Government reserves:

(a) An irrevocable, royalty-free license for the practice of such invention throughout the world by or on behalf of the United States or any foreign government in accordance with any treaty or agreement with the United States; and

(b) Such other March-in rights as given in Paragraph H below.

(2) NASA will not exercise the government purpose license reserved in paragraph C.(1)(a) during the term of this Agreement.

(3) Upon a successful completion by SNC of all milestones under this Agreement, NASA will refrain from exercising the government purpose license reserved in paragraph C.(1)(a) for a period of five (5) years following the expiration of this Agreement or until December 31, 2015, whichever is later.

(4) Nothing contained in this paragraph shall be considered to grant to the Government any rights with respect to any invention other than an invention made under this Agreement.

D. Minimum rights to SNC

(1) SNC is hereby granted a revocable, nonexclusive, royalty-free license in each patent application filed in any country on an invention made by SNC under this Agreement and any resulting patent in which the Government acquires title, unless SNC fails to disclose such invention within the times specified in paragraph E.(2) of this clause. SNC's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which SNC is a party and includes the right to grant sublicenses of the same scope to the extent SNC was legally obligated to do so at the time the Agreement was awarded. The license is transferable only with the approval of the Administrator except when transferred to the successor of that part of SNC's business to which the invention pertains.

(2) SNC's domestic license may be revoked or modified by the Administrator to the extent necessary to achieve expeditious practical application of such invention pursuant to an application for an exclusive license submitted in accordance with 37 C.F.R. Part 404, Licensing of Government Owned Inventions. This license will not be revoked in that field of use or the geographical areas in which SNC has achieved practical application and continues to make the

benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of the Administrator to the extent SNC, its licensees, or its domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

(3) Before revocation or modification of the license, SNC will be provided a written notice of the Administrator's intention to revoke or modify the license, and SNC will be allowed 30 calendar days (or such other time as may be authorized by the Administrator for good cause shown by SNC) after the notice to show cause why the license should not be revoked or modified. SNC has the right to appeal, in accordance with 14 C.F.R. 1245.112, any decision concerning the revocation or modification of its license.

#### E. Invention Identification, disclosures, and reports

(1) SNC shall establish and maintain active and effective procedures to assure that inventions made under this Agreement are promptly identified and disclosed to SNC personnel responsible for the administration of this clause within six months of conception and/or first actual reduction to practice, whichever occurs first in the performance of work under this Agreement. These procedures shall include the maintenance of laboratory notebooks or equivalent records and other records as are reasonably necessary to document the conception and/or the first actual reduction to practice of such inventions, and records that show that the procedures for identifying and disclosing such inventions are followed. Upon request, SNC shall furnish the Patent Representative a description of such procedures for evaluation and for determination as to their effectiveness.

(2) SNC will disclose each such invention to the Patent Representative within two months after the inventor discloses it in writing to SNC personnel responsible for the administration of this clause or, if earlier, within six months after SNC becomes aware that such an invention has been made, but in any event before any on sale, public use, or publication of such invention known to SNC. SNC shall use the NASA electronic New Technology Reporting system (eNTRe), accessible at <http://invention.nasa.gov>, to disclose inventions. The invention disclosure shall identify this Agreement and shall be sufficiently complete in technical detail to convey a clear understanding, to the extent known at the time of the disclosure, of the nature, purpose, operation, and physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale, or public use of any such invention and whether a manuscript describing such invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to NASA, SNC will promptly notify NASA of the acceptance of any manuscript describing such an invention for publication or of any on sale or public use planned by SNC for such invention.

(3) SNC shall furnish the Patent Representative the following:

(a) Interim reports every 12 months (or such longer period as may be specified by the Patent Representative) from the date of the Agreement, listing inventions made under this Agreement during that period, and certifying that all such inventions have been disclosed (or that there are no such inventions) and that the procedures required by paragraph E.(2) of this clause have been followed.

(b) A final report, within three months after completion of the work, listing all inventions made under this Agreement or certifying that there were no such inventions, and listing all subcontracts or other agreements with a Related Entity containing a patent and invention rights clause (as required under paragraph G of this clause) or certifying that there were no such subcontracts or other agreements.

(c) Interim and final reports shall be submitted electronically at the eNTRe Web-site <http://invention.nasa.gov>.

(4) SNC agrees, upon written request of the Patent Representative, to furnish additional technical and other information available to SNC as is necessary for the preparation of a patent application on an invention made under this Agreement in which the Government retains title and for the prosecution of the patent application, and to execute all papers necessary to file patent applications on such inventions and to establish the Government's rights in the inventions.

(5) Protection of reported inventions. When inventions made under this Agreement are reported and disclosed to NASA in accordance with the provisions of this Article, NASA agrees to withhold such reports or disclosures from public access for a reasonable time (presumed to be 1 year unless otherwise mutually agreed) in order to facilitate the allocation and establishment of the invention and patent rights under these provisions.

#### F. Examination of records relating to Inventions

(1) The Patent Representative or designee shall have the right to examine any books (including laboratory notebooks), records, and documents of SNC relating to the conception or first actual reduction to practice of inventions in the same field of technology as the work under this Agreement to determine whether

(a) Any such inventions were made in performance of this Agreement;

(b) SNC has established and maintained the procedures required by paragraph E.(1) of this clause; and

(c) SNC and its inventors have complied with the procedures.

(2) If the Patent Representative learns of an unreported SNC invention that the Patent Representative believes may have been made under this Agreement, SNC may be required to disclose the invention to NASA for a determination of ownership rights.

(3) Any examination of records under this paragraph will be subject to appropriate conditions to protect the confidentiality of the information involved.

#### G. Subcontracts or Other Agreements

(1)(a) Unless otherwise authorized or directed by the Patent Representative, SNC shall include this *Invention and Patent Rights* Article (suitably modified to identify the parties) in any subcontract or other agreement with a Related Entity hereunder (regardless of tier) for the performance of experimental, developmental, or research work.

(b) In the *Invention and Patent Rights* Article included in any such subcontract or other agreement, the following (suitably modified to identify the parties) shall be substituted for paragraph B(3)(b):

As provided in 14 C.F.R. Part 1245, Subpart 1, [insert name of Related Entity] may petition, either prior to execution of the Agreement or within 30 calendar days after execution of the Agreement, for advance waiver of rights to any or all of the inventions that may be made under this Agreement. If such a petition is not submitted, or if after submission it is denied, [insert name of Related Entity] may petition for waiver of rights to an identified invention within eight months of first disclosure of invention in accordance with paragraph E.(2) of this Article or within such longer period as may be authorized in accordance with 14 CFR 1245.105. Further procedures are provided in paragraph H of this Article.

(c) In the case of subcontracts or other agreements at any tier, NASA, the Related Entity, and SNC agree that the mutual obligations of the parties created by this Article constitute privity of contract between the Related Entity and NASA with respect to those matters covered by this Article.

(2) In the event of a refusal by a prospective Related Entity to accept such a clause, SNC:

(a) Shall promptly submit a written notice to the Patent Representative setting forth the prospective Related Entity's reasons for such refusal and other pertinent information that may expedite disposition of the matter; and

(b) Shall not proceed with such subcontract or other agreement without the written authorization of the Patent Representative.

(3) SNC shall promptly notify the Patent Representative in writing upon the award of any subcontract or other agreement with a Related Entity (at any tier) containing an invention and patent rights clause by identifying the Related Entity, the applicable invention and patent rights clause, the work to be performed under the subcontract or other agreement, and the dates of award and estimated completion. Upon request of the Patent Representative, SNC shall furnish a copy of such subcontract or other agreement, and, no more frequently than annually, a listing of the subcontracts or other agreements that have been awarded.

(4) In recognition of SNC's substantial contribution of funds, facilities and/or equipment to the work performed under this Agreement, SNC is authorized, subject to the rights of NASA set forth elsewhere in this Article, to:

(a) Acquire by negotiation and mutual agreement rights to an invention made under this Agreement by a Related Entity as SNC may deem necessary to obtaining and maintaining of private support; and

(b) Request, in the event of an inability to reach agreement pursuant to paragraph G. (4)(a) of this Article, that NASA request that such rights for SNC be included as an additional reservation in a waiver granted pursuant to 14 CFR Part 1245, Subpart 1. Any such requests to NASA should be prepared in consideration of the following guidance and submitted to the Patent Representative. Notwithstanding paragraph B.(3)(b) of this Article, the Related Entity should be advised that unless it requests a waiver of title pursuant to the NASA Patent Waiver Regulations (14 C.F.R. Part 1245, Subpart 1), NASA will acquire title to inventions made under this Agreement. If a waiver is not requested or granted, SNC may request a license from NASA consistent with the requirements of 37 CFR Part 404. A Related Entity requesting a waiver must follow the procedures set forth in paragraph I of this Article.

#### H. March-in rights

(1) SNC agrees that, with respect to any invention made under this Agreement in which it has acquired title, NASA has the right in accordance with the procedures in 37 CFR 401.6 and any supplemental regulations of the agency to require SNC, or an assignee or exclusive licensee of such an invention, to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if SNC, its assignee, or exclusive licensee refuses such a request NASA has the right to grant such a license itself if the Federal agency determines that

(a) Such action is necessary because SNC, assignee, or exclusive licensee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of such invention in such field of use;

(b) Such action is necessary because SNC, assignee, or exclusive licensee, having achieved practical application of such invention, has failed to maintain practical application of such invention in such field of use;

(c) Such action is necessary because SNC, assignee, or exclusive licensee has discontinued making the benefits of such invention available to the public or to the Federal Government;

(d) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by SNC, assignee, or exclusive licensee; or

(e) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by SNC, assignee, or exclusive licensee.

#### I. Requests for Waiver of Rights

(1) In accordance with the NASA Patent Waiver Regulations, 14 C.F.R. Part 1245, Subpart 1, waiver of rights to any or all inventions made or that may be made under this Agreement may be requested at different time periods. Advance waiver of rights to any or all such inventions may be requested prior to the execution of the Agreement, or within 30 calendar days after execution thereof. In addition, waiver of rights to an identified invention made and reported under this Agreement may be requested, even though a request for an advance waiver was not previously requested or, if previously requested, was not granted.

(2) Each request for waiver of rights shall be by petition to the Administrator and shall include an identification of the petitioner; place of business and address; if petitioner is represented by counsel, the name, address, and telephone number of the counsel; the signature of the petitioner or authorized representative; and the date of signature. No specific forms need be used, but the request should contain a positive statement that waiver of rights is being requested under the NASA Patent Waiver Regulations; a clear indication of whether the request is for an advance waiver or for a waiver of rights for an individual identified invention; whether foreign rights are also requested and, if so, for which countries, and a citation of the specific section(s) of the regulations under which such rights are requested; and the name, address, and telephone number of the party with whom to communicate when the request is acted upon.



(3) All petitions for waiver, whether advanced or individual petitions, will be submitted to the Patent Representative designated in this Article.

(4) A Petition submitted in advance of this Agreement will be forwarded by the Patent Representative to the Inventions and Contributions Board. The Board will consider the petition and where the Board makes the findings to support the waiver, the Board will recommend to the Administrator that waiver be granted, and will notify the petitioner and the Patent Representative of the Administrator's determination. The Patent Representative will be informed by the Board whenever there is insufficient time or information to permit a decision to be made on an advance waiver without unduly delaying the execution of the Agreement. In the event a request for an advance waiver is not granted or is not decided upon before execution of the Agreement, the petitioner will be so notified by the Patent Representative. All other petitions will be processed by the Patent Representative and forwarded to the Board. The Board shall notify the petitioner of its action and if waiver is granted, the conditions, reservations, and obligations thereof will be included in the Instrument of Waiver. Whenever the Board notifies a petitioner of a recommendation adverse to, or different from, the waiver requested, the petitioner may request reconsideration under procedures set forth in the NASA Patent Waiver Regulations.

#### ARTICLE 15. DISCLAIMER OF WARRANTY

Goods (e.g., equipment, facilities, technical information, data, and prototypes) and services, if provided by NASA under this Agreement, are provided "as is" and no warranty related to availability, title, or suitability for any particular use, nor any implied warranty of merchantability or fitness for a particular purpose, is provided under this Agreement. NASA makes no express or implied warranty as to any intellectual property, generated information, or product made or developed under this Agreement, or that the goods, services, materials, products, processes, information, or data to be furnished hereunder will accomplish intended results or are safe for any purpose including the intended purpose. Neither NASA nor its contractors shall be liable for special, consequential, indirect, or incidental damages attributed to such goods, services, materials, products, processes, information, or data furnished under this Agreement.

Goods (e.g., equipment, facilities, technical information, data, and prototypes) and services, if provided by SNC under this Agreement, are provided "as is" and no warranty related to availability, title, or suitability for any particular use, nor any implied warranty of merchantability or fitness for a particular purpose, is provided under this Agreement. SNC makes no express or implied warranty as to any intellectual property, generated information, or product made or developed under this Agreement, or that the goods, services, materials, products, processes, information, or data to be furnished hereunder will accomplish intended results or are safe for any purpose including the intended purpose. Neither SNC nor its contractors shall be liable for special, consequential, indirect, or incidental damages attributed to such goods, services, materials, products, processes, information, or data furnished under this Agreement.

#### ARTICLE 16. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall expire on December 31, 2010.

#### ARTICLE 17. TERMINATION

##### A. Termination by Mutual Consent.

This Agreement may be terminated at any time upon mutual written consent of both parties.

##### B. Termination for Failure to Perform.

(1) At its discretion, NASA may terminate this Agreement 30 calendar days after issuance of a written notification that SNC has failed to perform under this Agreement, including failure to meet a scheduled milestone as identified and described in Appendix 2 or failure to meet the objectives of the American Recovery and Reinvestment Act. Before making such a notification, NASA will consult with SNC to ascertain the cause of the failure and determine whether additional efforts are in the best interest of the parties. Upon such a notification and determination, NASA will take all rights identified in Articles 13 and 14 of this Agreement.

(2) SNC will not be entitled to any additional payments from the Government due to a termination for failure to meet a milestone. NASA and SNC will negotiate in good faith any other outstanding issues between the parties. Failure of the parties to agree will be resolved pursuant to Article 19, Dispute Resolution.

##### C. Unilateral Termination by NASA.

(1) NASA may terminate this Agreement upon written notice. NASA's obligations under this Agreement may be terminated, in whole or in part, (a) upon a declaration of war by the Congress of the United States; or (b) upon a declaration of a national emergency by the President of the United States; or (c) upon a NASA determination, in writing, that NASA is required to terminate for reasons beyond its control. For purposes of this Article, reasons beyond NASA's control include, but are not limited to, acts of God or of the public enemy, acts of the U.S. Government other than NASA, in either its sovereign or contractual capacity (to include failure of Congress to appropriate sufficient funding), fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, or unusually severe weather.

(2) Upon receipt of written notification that the Government is unilaterally terminating this Agreement, SNC shall immediately stop work under this Agreement and shall immediately cause any and all of its partners and suppliers to cease work, except to the extent that SNC wishes to pursue the activities defined in Appendix 2 exclusively using its own funding. Upon such a termination, NASA and SNC agree to negotiate in good faith a final settlement payment to be made by NASA. However, in no instance shall NASA's liability for termination exceed the



total amount due under the next milestone of this Agreement. Any such payment shall be subject to the provisions of Article 5. Failure of the parties to agree will be resolved pursuant to Article 19, Dispute Resolution.

D. Limitation on Damages.

In the event of any termination by NASA, neither NASA nor SNC shall be liable for any loss of profits, revenue, or any indirect or consequential damages incurred by the other Party, its contractors, subcontractors, or customers as a result of any termination of this Agreement. A Party's liability for any damages under this Agreement is limited solely to direct damages, incurred by the other Party, as a result of any termination of this Agreement subject to mitigation of such damages by the complaining party. However, in no instance shall either party's liability for termination exceed the total amount due under the next milestone under this Agreement.

E. Rights in Property.

SNC will have title to property acquired or developed by SNC and its contractors/partners with funding provided under this Agreement, in whole or in part to conduct the activities defined in Appendix 2.

#### ARTICLE 18. CONTINUING OBLIGATIONS

The obligations of the parties set forth in the provisions of Articles 11 (Liability and Risk of Loss) and 13-14 (Intellectual Property and Data Rights) of this Agreement and such other rights and obligations which by their terms continue past the expiration or termination of this Agreement shall so continue to apply.

#### ARTICLE 19. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the SNC Administrative Contact and the NASA Administrative Contact, who shall seek to resolve such disputes by mutual agreement. If they are unable to resolve the dispute, then the dispute will be referred to the JSC Commercial Crew Cargo Project Manager and the CEO of SNC for joint resolution. If the parties are still unable to resolve the dispute, the Associate Administrator for Exploration Systems Mission Directorate, or the Deputy of the Directorate, will seek to resolve the dispute, and if necessary issue a written decision that shall be a final Agency decision for all purposes including judicial review.

Pending resolution of any disputes pursuant to this Article, the Parties agree that performance of all obligations shall be pursued diligently in accordance with the direction of the JSC Commercial Crew Cargo Project Manager.

The Parties agree that this Disputes Resolution procedure shall be the exclusive procedure followed by the Parties in resolving any dispute arising under, or based on, an express or implied provision of this Agreement, including an alleged breach, with the exception for any allegation of reprisal raised under Article 10 of this Agreement. In those cases, the rights and remedies provided for in §1553 of ARRA govern.

#### ARTICLE 20. PRINCIPAL POINTS OF CONTACT

The following personnel are designated as the Administrative and Technical Contacts between the parties in the performance of this Agreement.

##### NASA Administrative Contact

Timothy Boyes, Agreements Officer  
Johnson Space Center  
Mail Code BT  
2101 NASA Parkway  
Houston, TX 77058  
Phone: 281-483-1838  
Fax: 281-483-0503  
E-mail: [timothy.a.boyes@nasa.gov](mailto:timothy.a.boyes@nasa.gov)

##### SNC Corp Administrative Contact

Mark N. Sirangelo, Executive V.P.  
  
Sierra Nevada Corporation  
1722 Boxelder Street  
Louisville CO 80027  
[REDACTED]  
Fax: 303-951-1993  
[REDACTED]

##### NASA Technical Contact

Valin Thorn  
Deputy Manager, Commercial Crew & Cargo  
Program  
Johnson Space Center  
Mail Code: QA  
2101 NASA Parkway  
Houston, TX 77058  
Phone: 281-244-7097  
Fax: 281-483-5970  
E-mail: [valin.b.thorn@nasa.gov](mailto:valin.b.thorn@nasa.gov)

##### SNC Technical Contact

Jim Voss  
Sierra Nevada Corporation  
1722 Boxelder Street  
Louisville, CO 80027  
[REDACTED]  
Fax: 303-951-1993  
[REDACTED]

#### ARTICLE 21. MODIFICATION/AMENDMENTS

All modifications and amendments to this Agreement shall be by mutual agreement of the Parties and shall be executed, in writing, and signed by the signatories to this Agreement, or their respective successor or designee.

#### ARTICLE 22. ASSIGNMENT OF RIGHTS

Neither this Agreement nor any interest arising under it will be assigned by either Party without the express written consent of the other Party.

#### ARTICLE 23. ANTI-DEFICIENCY ACT

All activities under or pursuant to this Agreement are subject to the availability of appropriated funds, and no provision shall be interpreted to require obligation or provision of funds in violation of the Anti-Deficiency Act, 31 U.S.C. 1341.

#### ARTICLE 24. APPLICABLE LAW

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of this Agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

If any portion of this Agreement is held invalid by a court of competent jurisdiction, the Parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, unless applying such remaining portions would frustrate the purpose of this Agreement.

#### ARTICLE 25. EXPORT LICENSES

SNC will be responsible for:

A. Compliance with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this Agreement. In the absence of available license exemptions/exceptions, SNC will be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data, and software, or for the provision of technical assistance.

B. Obtaining export licenses, if required, before utilizing foreign persons in the performance of this Agreement, including instances where CCDev efforts are to be performed on-site at NASA Centers, where the foreign person will have access to export-controlled technical data or software.

- C. All regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.
- D. Ensuring that the provisions of this Article apply to its contractors/partners.

In the event that either Party intends to utilize a foreign person (as defined in the ITAR and the EAR) in the performance of this Agreement, such Party shall be responsible for obtaining the required export licenses in advance of the foreign person's participation.

#### ARTICLE 26. LIMITATIONS ON ACTIVITIES WITH RUSSIAN ENTITIES FOR GOODS OR SERVICES

A. SNC shall not provide ARRA funding received under this Agreement in connection with any transaction to purchase goods or services with Russian entities without first receiving written approval from the NASA Administrative Contact. In order to obtain this written approval to engage in such transactions with any Russian entity, SNC shall provide the NASA Administrative Contact with the following information related to each planned transaction:

(1) A detailed description of the Russian entity, including its name, address, and a point of contact, as well as a detailed description of the proposed transaction including the specific purpose of payments that will be made under the transaction.

(2) SNC shall provide certification that the Russian entity is not on any of the denied parties, specially designated nationals and entities of concern, lists found at:

BIS's Listing of Entities of Concern: <http://www.access.gpo.gov/bis/ear/pdf/744spir.pdf>

BIS's List of Denied Parties: <http://www.bis.doc.gov/dpl/default.shtm>

OFAC's List of Specially Designated Nationals:  
<http://www.ustreas.gov/offices/enforcement/ofac/sdn/>

List of Unverified Persons in Foreign Countries:  
[http://www.bis.doc.gov/enforcement/unverifiedlist/unverified\\_parties.html](http://www.bis.doc.gov/enforcement/unverifiedlist/unverified_parties.html)

State Department's List of Parties Statutorily Debarred for Arm Export Control Act Convictions: <http://www.pmdetc.state.gov/compliance/debar.html>

State Department's List of Proliferating Entities:  
<http://www.state.gov/t/isn/c15231.htm>

B. Unless otherwise agreed by the NASA Administrative Contact, the information necessary to seek approval to enter into any transaction shall be provided to the NASA Administrative Contact 30 calendar days prior to entering into such transaction with any Russian entities.

C. After receiving approval to enter into a requested transaction, SNC shall provide the NASA Administrative Contact with a report not later than 10 calendar days after the end of each calendar quarter which documents the individual payments made to such Russian entity. Such



report shall meet the requirements of and include the information required under Article 5, Section (4), Financial Records and Reports.

D. For the purpose of this Article 26, the term "Russian entities" includes the following:


- (1) Russian persons, or
- (2) Entities created under Russian law (including any organization, entity, or element of the Government of the Russian Federation) or owned, in whole or in part, by Russian persons or companies.

ARTICLE 27. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

SIERRA NEVADA CORPORATION

BY:   
Geoffrey L. Yoder  
Director, Constellation Systems Division  
Exploration Systems Mission Directorate

  
BY: \_\_\_\_\_  
Mark N. Sirangelo  
Executive Vice President

DATE: 1/30/2010

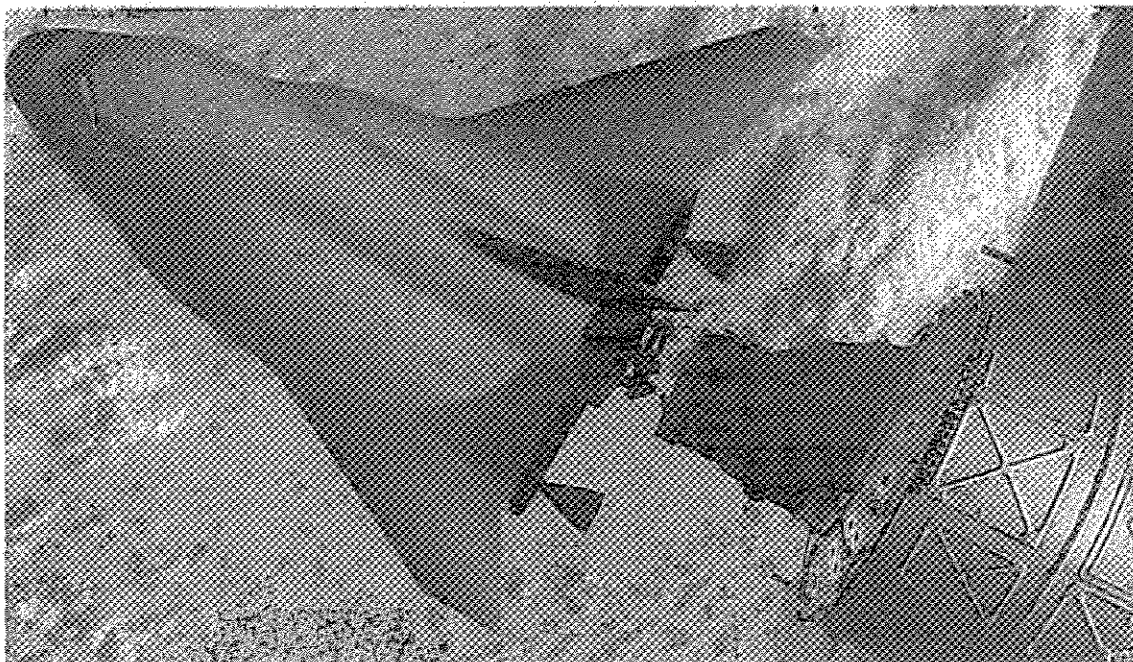
DATE: December 9, 2009

**Appendix 1 Redacted**  
**Section 1 Executive Summary**

Sierra Nevada Corporation (SNC) is prepared to partner with NASA to advance the development of a commercial crew space transportation system as part of the Commercial Crew Development (CCDev) program. SNC is committed to expanding the market for human spaceflight. Our studies of the potential users of commercial transport to low Earth orbit (LEO) indicate a strong business case with multiple government and civil customers needing orbital and suborbital transport. We will use funding from this program to continue our work to provide NASA with a means to fly crews to the International Space Station (ISS) to enable a commercial LEO human transport business. As a funded Space Act Agreement (SAA) partner, SNC will invest resources

- Significant risk retirement will be accomplished through early prototype development and testing.
- Our spacecraft design has strong NASA heritage and 8 years of SNC work to mature it.
- The Dream Chaser lifting body spacecraft offers significant advantages for human spaceflight.
- SNC is an established NASA partner with four milestones delivered under our unfunded Space Act Agreement over the past 2 years.

to create jobs and further the development of the Dream Chaser human spacecraft (*Figure 1-1*). This co-investment will produce significant progress on long-lead capabilities and technologies as well as reduce and retire significant risks for the existing Dream Chaser program. Together with our CCDev partners, Boeing, United Launch Alliance, Draper Laboratories, Adam Works, Aerojet, NASA Langley Research Center (LaRC), University of Colorado, and Alliance Spacesystems (MacDonald Dettwiler and Associates), SNC plans to create or maintain during this CCDev effort approximately 100 jobs in 10 states as required under the American Recovery and Reinvestment Act (ARRA).



**Figure 1-1. SNC Dream Chaser Lifting Body.** Our design comfortably and efficiently transports up to seven crewmembers and cargo to and from the ISS.

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*Sierra Nevada Corporation Proprietary — Competition Sensitive*

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In 2008 SNC acquired SpaceDev which had been working on the Dream Chaser for more than 6 years. The company has demonstrated their commitment to commercial human spaceflight by continuing the program using internal research and development (IR&D) funding. SNC has made progress since 2007 under an unfunded NASA SAA to mature the design and advance the development of this human spacecraft. Successful completion of four SAA milestones has resulted in significant advancement of the NASA HL-20 (Horizontal Landing – 20 lifting body) design that is the basis for the Dream Chaser. The addition of external funding will tremendously accelerate the development of our commercial crew transportation system, narrowing the gap in U.S. crew launch capability following retirement of the Space Shuttle. If sufficiently funded, SNC will transport crews to LEO by 2014.

### Section 1.1 Dream Chaser Overview

The Dream Chaser space system is the ideal spacecraft for human transport to LEO and has a significant heritage of completed development work. It is a third-generation design that continues years of NASA LaRC research and SNC engineering into a fully reusable, pressurized, lifting-body spacecraft which returns to Earth along a <sup>by</sup> glide path and lands horizontally. It is a piloted lifting body design evolved from the NASA LaRC HL-20 spacecraft in which NASA invested millions of dollars, more than 10 years of development effort, and thousands of hours of testing and design verification. Trade studies drove our decision to use a lifting body spacecraft because of the significant advantages it offers over capsules for human transport. Increased cross-range and lower g forces on entry improve safety and landing opportunities while providing a more benign entry environment for crew and experiment return.

Our updated Dream Chaser space system retains the outer mold line of the HL-20 design, whose aerodynamics have been refined through more than 1,200 LaRC wind tunnel tests, hundreds of hours of piloted flight simulation, and four successful (two orbital) flights of the similar Russian BOR-4. We have continued the development work started at NASA by incorporation of a new composite structure using modern construction techniques and materials, and integrating a new SNC developed onboard hybrid propulsion capability.

Every Dream Chaser mission will use humans-in-the-loop to enhance mission success, safety, and reliability as demonstrated by previous NASA programs. A pilot reduces software requirements, enables timely and effective decision-making, and provides greater likelihood of success of ISS docking operations. Eliminating automated rendezvous and docking by using a crewed spacecraft reduces development time and cost.

Dream Chaser will perform orbital maneuvers and abort using an internal propulsion system that features SNC hybrid rocket motor technology. Work under the CCDev program will move the technology readiness level (TRL) of our propulsion system components from a [REDACTED] <sup>by</sup>

To further reduce development time and risk for the Dream Chaser space system, an existing, reliable expendable launch vehicle will be used—the United Launch Alliance (ULA) Atlas V booster (Figure 1-2). We have

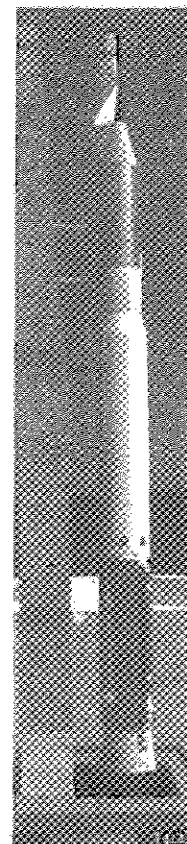
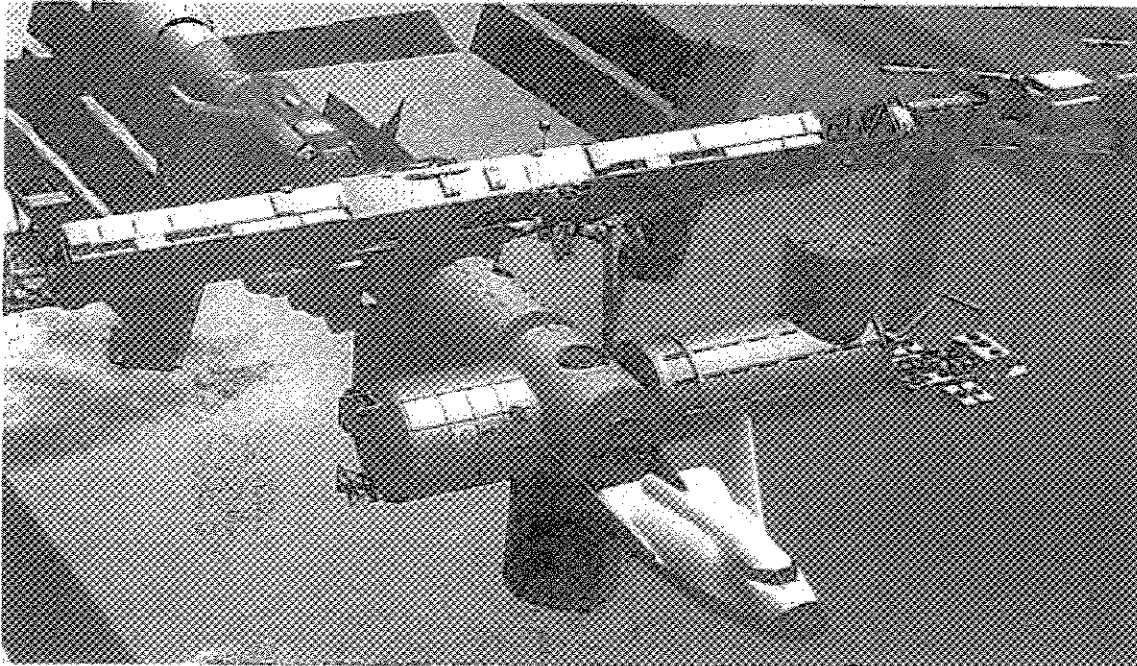


Figure 1-2. Dream Chaser/Atlas V. Dream Chaser uses a proven booster with established facilities.

worked with ULA more than 3 years to confirm the viability of integrating the Dream Chaser on top of an Atlas V. Engineering analysis by ULA confirms the feasibility of the Dream Chaser/Atlas V and further investigation is being done to define the structural and aerodynamic loads on the combined vehicle. The CCDev program will allow us to accelerate the combined vehicle integration and human rating plan. *Figure 1-3* presents the Dream Chaser at the International Space Station.

## Section 1.2 Maturation Plan

SNC has created a program plan to advance the development of the Dream Chaser from preliminary design through orbital flight test. We have been carrying out the early stages of this plan through internal funding and under an unfunded NASA SAA. Our strategy for the CCDev program is to continue this work in several specific areas that will enable continuation of the development after the CCDev period of performance. Under CCDev we will proceed from our current state of design through construction of an Engineering Test Article (ETA) that can have multiple developmental and test purposes. Progress will be made in aerodynamic and structural loads determination to enable fabrication of the ETA. The ETA will be used for structural testing, human factors and crew accommodations development, systems layout, and manufacturing technique development. As in all development programs, a great number of different systems must be matured simultaneously. We will accomplish this through parallel development to advance technologies and long-lead capabilities in main propulsion, the reaction control system (RCS), flight controls, guidance and navigation, thermal protection system, and characterization of gaps in the existing aerodynamic database. We will capitalize on the capabilities of our partner companies to rapidly bring their previous experience in spacecraft design to the Dream Chaser. These technology maturations will appreciably advance the overall development of our commercial crew spacecraft system. The ETA will be then used for a funded follow-on program that will consist of integration, outfitting, installing flight controls, and



*Figure 1-3. Dream Chaser at the International Space Station.*



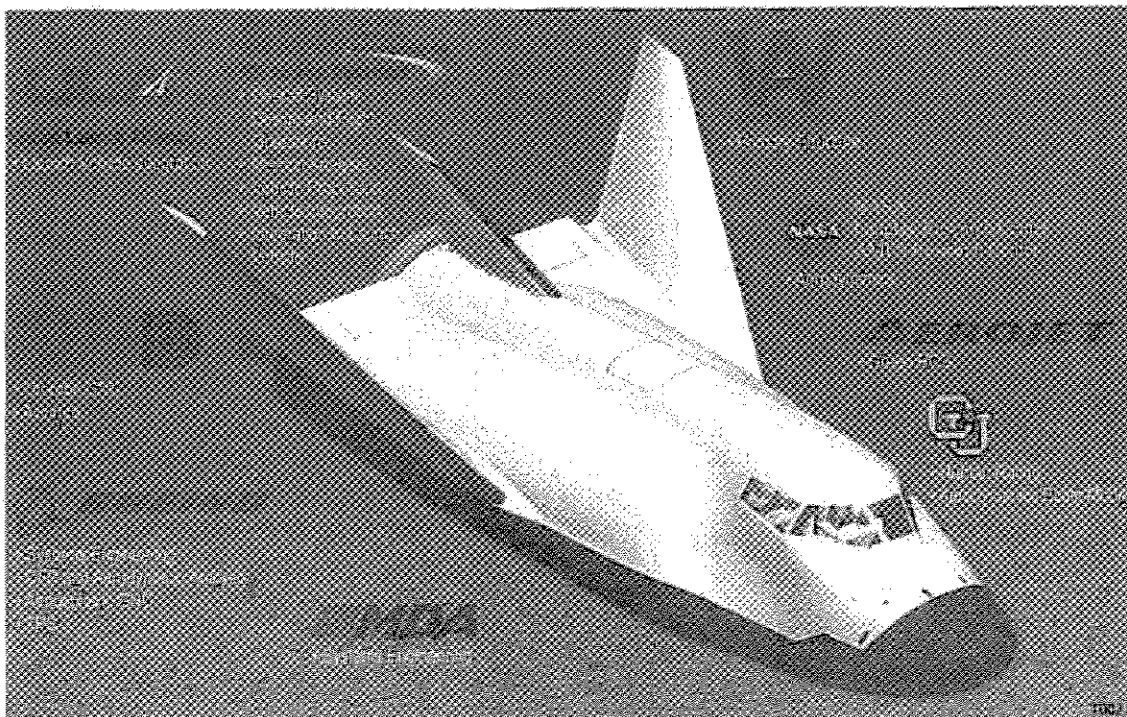
atmospheric flight testing. Compiling multiple technology developments into one integrated plan will retire significant risk to the development of the Dream Chaser. We will accomplish risk reduction in the areas of structural mass, aerodynamic stability and control, avionics, propulsion, booster integration, displays and controls, abort system, manufacturing, thermal protection, and internal systems. Risk mitigation is a major thrust of our near-term development plan with technical risk categories addressed by the conclusion of this program.

Since the ultimate goal is to safely transport crew and cargo to and from LEO and the ISS, development of the human rating plan and incorporation of ISS interface requirements will be integral parts of the CCDev effort. During the CCDev period of performance, our team will initiate the human rating plan and complete the flow down of the ISS interface requirements to the design.

Table 1-1 shows the value of the NASA investment to be realized in the long-lead capabilities, technology development and risk reduction work to be completed as we advance the Dream Chaser spacecraft system under the CCDev program. We will make considerable progress and will have tangible results at the end of this 10-month program.

Table 1-1: NASA Investment to be Realized in the Long-Lead Capabilities, Technology Development and Risk Reduction Work		
CCDev Task Areas	Tasks to be Completed	Results and System Advancements
<b>Long-Lead Capabilities</b>		
Systems Engineering	Perform requirements definition for GNC, structure, aborts, propulsion, Thermal Protection System (TPS), safety/mission assurance, and launch vehicle	Systems requirements document at Systems Requirements Review (SRR).
Analysis	Perform computational fluid dynamics (CFD) and engineering analysis of loads	Loads data to define structure and subsystems.
Software	Develop software assurance plan. Define flight algorithms.	Software assurance plan. Flight algorithms.
Atmospheric GNC	Design guidance, navigation and control (GNC) system. Build dynamic scale model for approach to landing testing. Perform autonomous landing system integration.	GNC hardware definition document, Dynamic scale model built and tested. Document long-leads for autonomous landing system.
Orbital GNC	Develop architecture & computer testbed. Develop algorithms.	Architecture definition document, test bed initiated.
Structure	Perform finite element analysis, design structure and tooling. Fabricate primary and lower aeroshell. Proof test.	Structure defined and ETA fabricated. Proof testing completed.
<b>Technology Development</b>		
RCS	Develop N2O/Ethane RCS; trades; design and build prototype	Prototype thruster complete and tested.
Propulsion	Fabricate SVPM with multi ignition capability, complete environmental test.	Test motor built and tested.
<b>Risk Reduction</b>		
Safety and Mission Assurance	Start human rating plan, integrate ISS requirements.	Reduced risks associated with human rating plan and ISS requirements. Human rating plan initiated and ISS requirements flowed down to DC.
TPS	Perform aeroheating CFD and engineering analysis for entry and abort. Complete TPS trades	TPS definition document. Lower risk through TPS design maturity.
Launch Vehicle Integration	Complete performance and structural analysis of DC / Atlas V Integrated vehicle. Perform Centaur sleeve design. Complete wind tunnel model and test plan.	Verification of integrated vehicle launch configuration. Wind tunnel model and test plan complete. Lowers risk of late discovery of stack incompatibilities.

To execute this program SNC has assembled a world class team (shown in Figure 1-4) specifically tailored for the CCDev effort. The Boeing Company brings great expertise in lifting body spacecraft including analysis, avionics, and controls. Their Phantom Works team's recent experience with the X-37 spacecraft fits perfectly with the planned Dream Chaser development and risk reduction activities. Boeing has extensive technical resources that complement those of SNC. ULA has been on the SNC team for more than 3 years; jointly working toward a



**Figure 1-4. SNC CCDev Team Members.** SNC plans to create and maintain approximately 104 jobs in 9 states.

booster/spacecraft combination that can rapidly bring a safe commercial human spacecraft to the LEO market. They will assist SNC with booster aerodynamic and integration risk retirement. Adam Works will complete structural design and fabrication of the ETA structure in combination with SNC's internal composite capability will manufacture the composite aeroshell. Aerojet will use their extensive experience to work with SNC on the design and development of the vehicle reaction control system. Draper Laboratory has unparalleled experience in spaceflight orbital guidance, navigation, and control (GNC) and will bring their many years of experience to the SNC team to retire risk and ensure orbital GNC is accounted for in early design efforts. With their HL-20 heritage, NASA LaRC will add great expertise in modeling for the program. The University of Colorado will assist with the Human Rating Plan as well as building, testing, and analyzing data for a sub-scale model of the Dream Chaser. Alliance Spacesystems, the U.S. operation of MacDonald Dettwiler & Associates (MDA) will provide systems engineering services to support Dream Chaser development. In addition to coordinating and managing the CCDev team, SNC will be responsible for engineering for the propulsion, structure, launch vehicle integration, as well as systems engineering.

### Section 1.3 Company Information

SNC is a proven systems integrator, electronic systems and space systems provider with a reputation for rapid, innovative, and agile technology solutions. As a 100% U.S. privately held woman-owned and operated business, SNC has been under the current ownership since 1993. SNC has a 45-year tradition of developing and manufacturing high technology spacecraft, space components, electronics, avionics, and communications systems. SNC employs a highly talented staff of more than 1,800 people—most of whom are scientists, engineers, or technical personnel. Our seven business areas operate in 20 states along with numerous customer support sites located

b4 throughout the world. SNC has a very solid financial foundation based on its 2009 revenues of [REDACTED] and an uninterrupted profitable growth history with no long-term debt during the past 15 years. SNC's strong financial track record and stable leadership structure have been a key element in the successful execution of hundreds of Government contracts every year. As rated by Dun & Bradstreet, SNC holds one of the highest possible scores, with a financial strength rating of [REDACTED]. SNC revenues have grown over [REDACTED] every year on average since 1994 with a consistent average YOY revenue growth of [REDACTED] for the past 6 years. SNC has continued this growth without sacrifice to the profit margin. In conjunction with a healthy balance sheet and income statement, SNC has access to a [REDACTED] available line of credit from a syndicate of top tier US Banks.

The SNC team has invested a substantial amount of capital, engineering, time and effort to develop the technologies that support our Dream Chaser spacecraft. These technologies and expertise include hybrid propulsion systems, complex composite structures, airframe design, spacecraft components, adapter rings, navigation and control, life support and integrated system design and testing capabilities. To date, our team's total investment in the above technologies has already exceeded [REDACTED]. This previous work and our continuing partnership with NASA will significantly lower the development time and risk, and will help to ensure program success.

The SNC Dream Chaser team for the CCDev program has hundreds of years of spacecraft development experience and has been involved with multiple spacecraft programs including Space Shuttle, ISS, and multiple Mars missions. The SNC program executive for CCDev is a five-time Shuttle astronaut, adding relevant operational experience to the management team. We are confident that our strong leadership team offers NASA significant advantages and expertise.

#### Section 1.4 NASA Milestone and Funding Information

b4 To supplement the SNC investment in this spacecraft development, we ask NASA to provide [REDACTED] to enable the full, cost effective design, development, and fabrication of the Dream Chaser ETA components. Should that level of funding not be available, atmospheric guidance, navigation, and control work will be deferred, reducing the NASA investment to [REDACTED]. For the lower funding of [REDACTED], substantial risk reduction can be completed, but work would be deferred on selected systems to include thermal protection, reaction control, as well as wind tunnel and dynamic scaled models. If NASA awards the full [REDACTED] requested, significant risk reduction will be made to the SNC commercial crew spacecraft and the time to completion of an orbital test vehicle will be dramatically reduced. *Appendix 2* provides our proposed milestones. If additional funds beyond the [REDACTED] are available, SNC has identified tasks that could be performed.

#### Section 1.5 Eligibility

SNC is an entity organized under the laws of the United States and is more than 50 percent owned by United States nationals, so is eligible to submit a proposal under the provisions of Section 4.2 of the Commercial Crew Development Announcement No. JSC-CCDev-1.

## APPENDIX 2: Performance Milestones and Success Criteria

<p><b>Milestone 1: Program Implementation Plan</b></p> <p><b>Description:</b> Subsequent to Space Act Agreement execution, SNC shall conduct an initial meeting to describe the plan for its Program implementation, which includes management planning for Design, Development, Testing, &amp; Evaluation supplier engagement, risks and anticipated mitigations. SNC shall provide a briefing of the program implementation plan, along with a hard copy of the presentation materials, and responses to any questions that the NASA Team might have concerning the SNC plan.</p> <p><b>Success Criteria:</b> Successful completion of the program implementation plan review as described above.</p>	<p>Amount: \$ <u>5,000,000</u> Date: January 2009</p>
<p><b>Milestone 2: Manufacturing Readiness Review of Aeroshell Tooling</b></p> <p><b>Description:</b> DC Aeroshell tooling Manufacturing Readiness Review (MRR) is complete and the aeroshell surface tooling is ready to begin composite construction.</p> <p><b>Success Criteria:</b> Meet the criteria specified in the SNC Manufacturing Readiness Review Entrance and Success Criteria (Table 2 of Appendix 2) The windward aeroshell surface of DC tooling has passed inspection and is ready for fabricating composite layups.</p>	<p>Amount: \$ <u>10,000,000</u> Date: April 2010</p>
<p><b>Milestone 3: Dream Chaser Hybrid Rocket Motor Test Firings</b></p> <p><b>Description:</b> Manufacture of and ground based motor firings of a single Dream Chaser hybrid rocket motor will be demonstrated. The rocket motor firings will follow a nominal mission profile with burn durations representative of the orbit circularization burn, one rendezvous burn, and the de-orbit burn. The second and third firings will demonstrate the motor re-start capability and one of the firings will demonstrate a vacuum ignition.</p> <p><b>Success Criteria:</b> Successful completion of a Dream Chaser hybrid rocket motor ground test that demonstrates three motor starts and burns representing a nominal mission profile as indicated in the milestone description. One of the firings must be successfully initiated in a vacuum condition.</p>	<p>Amount: \$ <u>3,500,000</u> Date: July 2010</p>
<p><b>Milestone 4: Dream Chaser ETA Preliminary Structure Proof Testing</b></p> <p><b>Description:</b> Space Vehicle Primary structure consisting of bulkheads, pressurized tunnel and crew compartment assembled to support landing gear and SVPM thrust loads. These loads will be applied to of design loads using equivalent static loading conditions at room temperature.</p> <p><b>Success Criteria:</b> Successful completion of the static load test of the primary structure as outlined in test plan.</p>	<p>Amount: \$ <u>1,500,000</u> Date: August 2010</p>

**Table 2 : SNC Manufacturing Readiness Review Entrance and Success Criteria**  
**(Derived from NASA NPR 7123.1A dated March 26, 2007)**

The Sierra Nevada Space Systems MRR determines the readiness of the system developers to efficiently produce the required tooling. It ensures that the manufacturing plans and personnel are in place and ready to begin manufacturing.

Manufacturing Readiness Review	
Entrance Criteria	Success Criteria
<p>1. The significant manufacturing engineering problems encountered during development are resolved.</p> <p>2. The design documentation is adequate to support manufacturing.</p>	<p>1. The design is appropriately certified by SNC</p> <p>2. Adequate measures are in place to support manufacturing.</p> <p>3. Design-for-manufacturing considerations ensure ease and efficiency of manufacturing and assembly.</p> <p>4. Risks have been identified, credibly assessed, and characterized, and mitigation efforts have been defined.</p> <p>5. The bill of materials has been reviewed and critical parts identified.</p> <p>6. Delivery schedules have been verified.</p> <p>7. Alternate sources for resources have been identified, as appropriate.</p> <p>8. Adequate spares have been planned and budgeted.</p> <p>9. Required facilities and tools are sufficient starting manufacturing.</p> <p>10. Specified special tools and test equipment are available in proper quantities.</p> <p>11. Manufacturing and support staff are qualified.</p> <p>12. Tooling Drawings are certified by SNC.</p> <p>13. Manufacturing engineering and planning are sufficiently mature for cost-effective manufacturing.</p> <p>14. Tooling processes and methods are consistent with quality requirements and compliant with occupational safety, environmental, and energy conservation regulations.</p> <p>16. SNC Qualified suppliers are available for materials procured.</p>